

SEQUENCE OF OPERATION Armstrong Variable Speed Domestic Water Pump Systems

3-Pump System

The following is the sequence of operation for a variable speed, 3-pump domestic water pump package equipped with individual variable frequency drives. The unit must be powered and the individual pumps in the auto position for the sequence to occur.

1. The pump designated as the lead pump shall run to maintain a constant system pressure.
2. The pump controller compares a signal from the discharge pressure transducer to the desired set point value. The lead pump speed will ramp up in order to satisfy the set point pressure.
3. Once the lead pump exceeds its best-operating-point (BOP) and the set point pressure is not attained the first lag pump is started following a 10 second time delay.
4. Once the lag pump is called on a minimum run timer (MRT) shall begin counting to ensure that the lag pump runs for a minimum of 5 minutes. The MRT shall be adjustable through the operator interface.
5. With both pumps running above the desired BOP the second lag pump is turned on following an On-Delay of 10 seconds.
6. When 3 pumps are running and are operating at a point below the BOP and the 2nd lag pump minimum run timer having timed out, the 2nd lag pump will ramp down in speed and then turn off.
7. When 2 pumps are running and are operating at a point below the BOP and the lag pump minimum run timer having timed out, the lag pump will ramp down in speed and then turn off. The lead pump will continue to operate and meet system requirements based on the set point pressure. Steps 2-7 are repeated in order to satisfy the building requirements.
8. The lead pump shall alternate after every 24 hrs via a real time clock. The time clock will bring on the next available pump, for a period of 5 seconds both pumps will operate at which point the first pump on will be shut off.
9. An Aquastat connected to the pump seal chambers monitors the water temperature and energizes a solenoid that will allow water to drain and prevent the pumps from overheating during long periods of low demand.
10. Systems equipped with a "No-Flow" shutdown will stop when the pump controller determines there has been a "No-Flow" condition for a continuous 2-minute period. The lead pump will start again once a drop in pressure of at least 5 psi is measured on the discharge of the system.
11. The system can be manually operated by means of the virtual HOA selector buttons on the touch screen operator interface.

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